

5.1 Sequences

Ex 1/

$$a_n = \frac{1}{2^n}$$

$\nwarrow \quad \swarrow$

the $n=3$ term of
the sequence ↑

$\{a_n\}$ or $\{a_n\}_{n=1}^{\infty} = \left\{ \frac{1}{2(1)}, \frac{1}{2(2)}, \frac{1}{2(3)}, \dots \right\}$

↑ ↑ ↑
 $n=1 \quad n=2 \quad n=3$

the general term
of the sequence

$$= \left\{ \frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \dots \right\}$$

Find an explicit formula for a_n .

Ex 2/

Common ratio $r = -\frac{1}{3}$

proves this is
a geometric sequence

$$\boxed{a_n = a \cdot r^{n-1}}$$

How to Obtain Explicit Formulae

$$a_1 = 2$$

$$a_2 = a_1 \left(\frac{a_2}{a_1} \right) = a_1 \cdot r$$

$$a_3 = a_2 \left(\frac{a_3}{a_2} \right) = a_2 \cdot r = (a_1 \cdot r) \cdot r$$

$$a_n = 2 r^{n-1}$$